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THE MANCHESTER SHIP CANAL

The Manchester Ship Canal, connecting the city of Manchester with the sea at Liverpool on the northwest coast of England, has attracted much attention in the United States during the last few years of canal agitation. Members of the Chicago Harbor Commission recently made a visit of inspection of the Manchester harbor and docks, and incidentally of the canal; and only last October the National Waterways Commission observed both the engineering and the commercial aspects of the canal, though they gave it only brief mention in their preliminary report on European waterways. Much has been written about it in this country in a descriptive way; its engineering features have been exploited, its praises have been sung; but hitherto no careful study has been attempted with a view to ascertaining whether it has been economically successful, and whether it affords a reliable basis for conclusions as to the feasibility of similar enterprises in the United States. A brief history and description of the project is given here because of the light it throws upon English methods, and upon subsequent developments along the canal; but the body of the present discussion is devoted to the economic aspects of the waterway.

As in the decade following 1820 the monopolistic rates charged by canal between Manchester and Liverpool started an agitation which led directly to the construction of a railway between the two cities, so, in turn, in the eighties the high railway tariff between the same points developed an agitation which resulted in the Manchester Ship Canal. There had been occasional proposals as early as 1840, but no definite steps were taken until 1882, when a provisional committee indorsed the project, and raised a fund for the purpose of defraying the necessary expenses incident to the securing of a charter from Parliament. Three years of persistent effort on the part of the promoters of the project were required before parliamentary sanction could be secured. England, in contrast to the United States, has never

adopted the policy of passing general incorporation laws. Her railways have one by one been required to secure from Parliament a special, distinct charter. Instead of having merely to conform to certain specifications laid down in a general law, each company has been rigidly required to prove the necessity for its existence, before a charter would be granted. To prove the necessity of a ship canal, adequate for ocean-going vessels, from Manchester to the sea, was no easy matter. Determined opposition developed on the part of the railways, the Mersey Docks and Harbor Board, the Liverpool corporation, and the owners of great estates. The case for the canal was submitted with a fulness of detail seldom equaled, and in startling contrast to the slipshod method prevalent in the United States. In the parliamentary sessions of 1883-85 no less than 175 days were consumed in the discussion of the project.¹ Witnesses were cross-questioned as in a criminal trial, and their statements and statistics were subjected to the most searching criticism. As many as 326 petitions in favor of the project were presented by cities, chambers of commerce, and trading and manufacturing companies of the district interested.² The authorizing act was finally passed in 1885. The estimated necessary funds were secured in the following two years, the stock being subscribed for by the business people of Manchester and neighboring cities. Construction work was begun in November, 1887, and the waterway was opened for traffic on January 1, 1894.

The building of the waterway was a magnificent engineering feat. The length of the canal is 35½ miles, and it has a depth for the entire distance of 28 feet, and a bottom width of 120 feet.³ There are five sets of gigantic locks, necessitated by the

¹ Tracy, "The Manchester Ship Canal. The Story in Brief," *Journal of Manchester Geographical Society*, July, 1907.

² *Ibid.*

³ A comparison of the Manchester Canal with other noted canals follows:

	Depth	Bottom Width
Suez.....	26 feet	72 feet
Amsterdam.....	23 "	89 "
Manchester	28 "	120 "

70 feet elevation of Manchester above the sea-level. Among the engineering features are a number of tremendous swing-bridges, a huge sea wall, rising in places from a depth of 40 feet, and averaging 12 feet in thickness, and the Barton aqueduct, by means of which the Bridgewater Canal is carried over the Ship Canal and its course stopped and swung at right angles during the passage of large ships.

The cost of the waterway, to January 1, 1894, the date of opening, was:⁴

For construction and all expenses.....	£11,750,000
Land and compensation.....	1,330,000
Bridgewater Canal property.....	1,780,000
<hr/>	
Total	£14,860,000

A deepening of two feet, together with the construction of docks, sheds, and other necessary equipment, had raised the total expenditure on capital account by December 31, 1909, to £16,-790,491, or nearly \$84,000,000.⁵

Magnificent docks, nine in number, have been constructed on a commodious scale, with an eye to future needs. There is a solid concrete and steel shed, half a mile long and three stories in height, and a huge grain elevator with a capacity of 1,500,000 bushels, equipped with the most modern improvements. The dock equipment includes 53 hydraulic, 61 steam, and 9 electric cranes, capable of lifting from 1 to 10 tons to a height of from 13 to 59 feet; a 30-ton steam crane; 47 locomotives; 6 floating pontoons of a dead-weight capacity of 800 tons each; and all modern appliances for giving vessels quick dispatch. There is also a pontoon sheers capable of dealing with weights up to 250 tons, with a lift of 21 feet.⁶ In fact, no money has been spared to make the canal, harbor, and docks thoroughly modern and efficient.

Ocean vessels from all parts of the world now load and unload their cargoes of every description at this inland seaport,

⁴ Tracy, *op. cit.*

⁵ *Port of Manchester Official Sailing List and Shipping Guide*, April, 1909, p. 97.

⁶ *Ibid.*, p. 94.

already fourth in importance in the United Kingdom. The ships are towed up the canal by large tugs. Competition has forced down the rates charged by the railways, while the canal-borne traffic travels at a still lower cost. Distributing business has been built up in Manchester, and the relative decline of the city has been checked in no small degree. The transshipping business alone furnishes a large amount of employment, and, in addition, new industries have developed on the canal. All this means more business and larger opportunity for the people of Manchester, whose splendid enterprise has brought the sea inland to the very center of their business activities.

Such, in brief, is the story of the Manchester Ship Canal as it is customarily told. The conclusion commonly drawn from such cursory sketches is that this deep waterway is an unqualified success—that here is substantial proof of the beneficent results of ship canals. A careful first-hand investigation of the entire project has, however, led the writer to the conclusion, that the Manchester Ship Canal has fallen far short of fulfilling the expectations of its builders, and that, splendid engineering achievement as it is, its economic advantages are of very questionable importance.

In the first place, the canal cost more than twice the amount of the original estimate. The very carefully prepared report of the committee formed to consider the Manchester Ship Canal, which was submitted in 1886, estimated “that the Ship Canal and works can be completed ready for traffic at a cost within the estimate of £5,750,000, and that the sum of £802,936 set down for the purchase of the necessary land is a safe estimate.”⁷ In addition to this it was estimated that the Bridgewater Canal property to be purchased would cost £1,710,000,⁸ making a total of £8,262,936. The contract was let for the construction of the canal at the above figure, but the chief engineer, finding himself utterly unable to complete the work under double the amount of his bid, gave up in despair,⁹ and the work had to be finished by

⁷ The report of the committee, p. 4.

⁸ *Ibid.*

⁹ This engineer, Mr. Walker, died, before the completion of the work, it is said of a broken heart over his failure.

others. Expenditures kept mounting higher and higher, and it became necessary for the company to borrow an extra £5,000,000 (\$25,000,000) from the city of Manchester in order to finish the work. By December 31, 1909, the expenditure on capital account stood as follows:¹⁰

Construction of works (including plant and equipment)	£10,956,792
Bridgewater Canal	1,268,286
Land (purchase and compensation)	1,502,850
Engineering and surveying	194,210
Interest on share and loan capital	1,170,734
Parliamentary expenses	195,022
General expenses	448,357
Interest on debentures discharged by the issue of a like amount of preference stock to the corporation of Manchester	1,054,240
	<hr/> £16,790,491

There is no question that had it been known in advance that the cost of the canal would approximate a total of nearly \$75,000,000 on opening day in 1894, and nearly \$9,000,000 more in the next sixteen years, the project would never have been undertaken.

In the second place, the anticipated earnings have not been realized. The committee above mentioned estimated the net revenue for the second year of operation at £479,430. "This sum, which we consider a safe estimate, would be sufficient to pay a 5 per cent. dividend upon the whole share capital of the company [£8,000,000], and to leave a surplus of £79,430."¹¹ How has this prophecy, made after a very careful investigation, been fulfilled? In the second year of canal operation the *gross* revenue was only £137,474,¹² but little more than one-fourth of the estimated *net* revenue. Sixteen years have now elapsed and never has the company been able to make ends meet. Never yet has it been possible to meet in full the interest on the £5,000,000

¹⁰ *Port of Manchester Official Sailing List and Shipping Guide*, April, 1910, p. 97.

¹¹ *Report of the Committee Formed to Consider the Manchester Ship Canal*, p. 15.

¹² *Port of Manchester Official Sailing List and Shipping Guide*, April, 1910, p. 97.

borrowed from the city of Manchester. At the close of the year 1909, a balance of £6,990 of interest remained unpaid.¹³ There is a perennial hope that the interest payments may be met in the near future, but shareholders have almost ceased even to dream of dividends.

There appear to be two reasons for this failure to pay dividends—excessive expenditures, and small traffic. Since the experience of the Manchester Canal is typical of practically all similar enterprises, it seems advisable to show here in some detail the situation as it developed. The expenditures will be considered first.

It had been calmly assumed, as is usually the case in quasi-public undertakings of this kind, that once the canal was open for traffic, thereafter all would be, literally, smooth sailing. Three years after the date of completion, however, a special report on the physical and engineering features of the waterway was submitted, which showed how numerous were the points of weakness in the canal, and indicated how heavy might be the expense connected therewith. Here are appended a partial list of the difficulties to be encountered.¹⁴

1. A crowded entrance at Liverpool.
2. A poor entrance at Eastham.
3. Only one entrance to the canal, which might cause a blockade from mishaps, such as the grounding or wrecking of boats, disablement of lock gates, or of swing-bridges, landslips in the cuttings, floods and storms, or loss of water.
4. The silting-up of the tidal portion of the canal.
5. The failure of sea embankments at Ellesmere Port.
6. Dangers of the Weaver River.
7. Dangers from cross traffic at Runcorn.
8. Dangers in the deep cuttings at Norton.
9. Encroachments by estuary floods and storms.
10. Dangers at swing-bridges.
11. The liability of the caving-in of rock cuttings.
12. Dangers from defects in locks and sluice gates.
13. The instability of lock walls.
14. Deficient dock and trade arrangements.

¹³ Statement of accounts, general balance sheet, December 31, 1909.

¹⁴ *Manchester Ship Canal. Physical and Engineering Features.* Special Report by an Expert, 1897, p. 8.

Obviously, not all, nor even many of the above difficulties would have to be met at once, but at any time large unexpected expenses were likely to arise; while some of the difficulties were, indeed, a constant problem, as the maintenance of adequate dockage and trading facilities, and the incessant dredging that was necessary.

It is to the credit of the company that no expense has been spared in attempting to make the physical equipment of the best. Untiring effort and great expense have likewise been undergone in trying to better the facilities of trade. A list of questions was sent out in 1897 to shippers asking whether they were using the canal; if so, with what success; if not, why not. Suggestions were also asked in every case. The answers returned showed that in many instances the canal was not used because of poor service in handling, etc.; very frequently it was stated that foreign shippers were averse to risking their goods upon the canal; and ship-owners hesitated to send their ships thirty-five miles inland to Manchester. Such problems as these were not to be overcome without the expenditure of a deal of effort and a tremendous amount of money. Even then, as will be seen, they were by no means wholly removed.

One of the most serious problems in inland water transportation, everywhere, is the filling up of the channel with silt. "It is manifest that the difficulties of dredging in the docks and in the restricted channel of the [Manchester] Canal, simultaneously with continuous use by shipping, will be almost insuperable."¹⁵ For the half-year ending December 31, 1909, the cost of dredging was £20,282,¹⁶ or almost equal to the total outlay for salaries of managers, and wages of all the employees of the canal company, which amounted to £24,535.¹⁷ Over \$200,000 a year, then, is the cost of dredging, alone, in a canal only 35½ miles in length—nearly \$6,000 per mile annually to keep the channel freely navigable.

The anticipated tremendous traffic has not yet been realized.

¹⁵ *Ibid.*, p. 9.

¹⁶ Statement of account, December 31, 1909.

¹⁷ *Ibid.*

There has been an earnest desire on the part of Manchester business men to see the canal prosperous. Having expended many millions of pounds sterling in bringing the sea to their midst they were naturally anxious to co-operate in making the canal a success. Answers to the queries which the company sent out in 1897 showed as a rule that the shippers were making use of the canal wherever possible, sometimes even at a loss, in the hope that service would improve and the enterprise be ultimately successful. Yet with this unusually favorable disposition on the part of the shipping public, traffic failed to expand rapidly. There are many reasons.

We have already mentioned the hesitation of ship-owners to risk their vessels on inland waters; the objections of foreign shippers to the transit of their goods on the canal, because of delays, ungrounded fears, or what not; and the slow and often inefficient service rendered on the canal. Moreover, it was soon realized that the savings on freight were far from being as great as had been computed. It had been contended that enormous savings would accrue, not alone to all places on the canal and to points directly east of Manchester, but to the entire surrounding country, north and south of the canal as well. But it frequently did not work out that the rate from Liverpool to Manchester by canal, plus the railway charge from Manchester to some city X, Y, or Z, was less than from Liverpool to this point direct by rail, especially when the delays and inconveniences of the canal route were considered. In consequence of these conditions traffic did not expand with the rapidity predicted. Below is a statement of the annual tonnage during the sixteen years of the canal's existence.¹⁸

It is to be noted that the increase has been very slow, indeed, and that since 1907 there has been an actual falling-off in tonnage. The considerable decrease in 1908 was said to be due in large part to the widespread industrial depression of that year. It was expected that 1909, a far better year, would mark a return to normal, but the statistics show a still further decline in that year, and the first two months of 1910 show a decrease in revenue

¹⁸ *Report of Directors*, December 31, 1909.

of £3,018¹⁹ over the corresponding months of 1909. Nor is the outlook for the future encouraging. The latest semiannual shareholders' report is decidedly gloomy. Where, if in any place, one

Year	Sea-borne Traffic, Tons	Barge Traffic, Tons	Total Tons
1894.....	686,158	239,501	925,659
1895.....	1,087,443	271,432	1,358,875
1896.....	1,509,658	316,579	1,826,237
1897.....	1,700,479	365,336	2,065,815
1898.....	2,218,005	377,580	2,595,585
1899.....	2,429,168	348,940	2,778,108
1900.....	2,784,843	275,673	3,060,516
1901.....	2,684,833	257,560	2,942,393
1902.....	3,137,348	280,711	3,418,059
1903.....	3,554,636	292,259	3,846,895
1904.....	3,618,004	299,574	3,917,578
1905.....	3,993,110	260,244	4,253,354
1906.....	4,441,241	259,683	4,700,924
1907.....	4,927,784	282,975	5,210,759
1908.....	4,317,965	264,531	4,582,496
1909.....	4,290,765	272,636	4,563,401

would expect to find an expression of optimism for the future, we read in the secretary's words:

I do not see any present prospect of going ahead with really rapid strides;²⁰

and again:

I do not know that the repetition or frequent reiteration of our pressing need is likely to do much good, yet I cannot refrain from saying that if more patriotism could somehow or other be infused into the mercantile and manufacturing community of this district we should soon have a large expansion of traffic.²¹

In the light of such statements the case seems clear to an unbiased observer. The people who went deep into their pockets to build a canal for the salvation of their city now, from lack of patriotism, it is said, do not make use of their own waterway. Manufacturers and traders are usually business men more than patriots, and the only reasonable explanation for their not using the canal is that it is more profitable not to use it. There is

¹⁹ *Port of Manchester Official Sailing List and Shipping Guide*, p. 97.

²⁰ *Report of the Half-yearly Meeting of Shareholders*, February 17, 1910, p. 9.

²¹ *Ibid.*, p. 8.

something almost naïve in the following quotation from the above report :

For some reason or other they [the manufacturers and merchants] still quote the same price for delivery at various ports and take the chance of having to deliver the goods and pay the carriage to such ports as even London and Glasgow, although they themselves are near to Manchester. It is difficult to get at the bottom of it. When you hear that works are leaving inland towns to get on the sea, it seems to me a very curious thing that when the sea is brought to the manufacturers, they are not eager to make use of it.²²

May it not be suggested that the constant deterrent is a something inherent in an inland ship canal itself, as a means of transportation? When it would seem to be to the direct interest of these shippers to use the waterway as much as possible, in the hope of receiving dividends on their share investments, and in order to build up Manchester and the surrounding territory, thereby enlarging their businesses and increasing their opportunities, the fact that they employ other means of transportation seems well-nigh conclusive evidence against the earning capacity of a ship canal.

The amount of traffic carried in barges, as shown by the above table, is likewise very instructive. It is particularly interesting in view of the fact that in the United States barge canals are looked upon with much favor as a solution of our transportation problem. It should be observed that the tonnage of barge traffic on the Manchester Canal has remained almost a constant quantity for sixteen years, and comprises only about one-seventeenth of the total canal traffic; and this in face of the fact that the Ship Canal has direct communication with fourteen barge canals, tapping the central manufacturing region of England, the Lancashire, Yorkshire, and Birmingham districts.

In another, though indirect, manner it was hoped that the great canal would reward the expenditures of its builders. It was believed that in addition to building up a huge traffic by water, and securing for all time low transportation charges, the Manchester Ship Canal would attract many new industries to the re-

²² *Ibid.*, p. 8.

gion. The report of the committee of 1886²³ expressed the conviction that along the entire length of the canal great manufacturing establishments would be erected, that ship-building would become a great industry on the banks of the canal, and that Warrington, Runcorn, and other intermediate cities between Manchester and Liverpool would quickly become thriving commercial ports. Traveling the length of the canal sixteen years after its opening, one sees scant evidence of the fulfilment of this brilliant promise. There is some shipping at intermediate points, to be sure; naturally some new industries have been established along the canal; but ship-building there is none, and remarkable industrial development has not been present, as witness only too plainly the tonnage and revenue statistics already given.

It is the opinion of the business men of Manchester that the chief benefits from the canal have come through the growth of population and the expansion of business—benefits unascertainable in amount, but none the less existent, and none the less important. Attempts have been made by supporters of the waterway to claim a prodigious growth in Manchester since the canal was built. But population statistics do not bear them out. The census returns show the following statistics for a number of rival cities in northern England:

	1891	1901	Increase, per cent.
Hull.....	200,472	240,618	20
Leeds.....	367,505	428,953	16.6
Birmingham.....	478,113	522,182	9.2
Liverpool.....	629,548	684,947	8.7
Manchester.....	505,368	543,969	7.5

Later statistics would be better evidence, but they are not available. In 1901, however, the canal had been open eight years, and the anticipation of its beneficent results should have stimulated industry and business before the waterway was actually ready for traffic. Consequently, the above figures furnish good evidence as to the benefits of the canal. They show a less rapid growth in Manchester than in any of the other large cities in northern England. Perhaps without the canal Manchester

²³ *Op. cit.*

would have gained even less rapidly, but at all events it can hardly be contended that a remarkable growth of the city has resulted from its water connection with the sea.

Again, it was hoped that the entire surrounding territory would receive a reviving impetus, that unemployment would cease, that unalloyed contentment would reign in all the district. Alas, however, we find today more unemployment than ever before. In fact, Lancashire and Yorkshire form the center of English discontent. Even as this is being written a large body of public speakers, sent out by the anti-socialistic union, is en route to the north of England in a desperate effort to quell the rising tide of socialism, which is the outgrowth of low wages and unemployment. Large and increasing numbers of emigrants are leaving the country for English dominions over-seas. The canal in this, as in other respects, appears to have been a failure.

But what of the potential competition which the waterway has offered? Has not it paid for itself indirectly by forcing the railways to lower their rate schedules? In all justice to the canal it must be said that in many cases it has brought about lower rates on the railways than existed prior to the opening of the waterway. No statistics are, however, available as to the amount of such reductions and the consequent savings to industry. They vary with the character and with the destination of the traffic. The relatively slow growth of population and the rather stagnant condition of industry would seem to indicate, however, that these indirect benefits have not been very great in comparison with the outlay. It would require an enormous saving in freights indeed to repay the people of Manchester for an expenditure of \$84,000,000. The canal had cost, up to the beginning of the year 1910, \$2,400,000 per mile. A waterway, the benefits of which depend mainly upon the potential competition secured is always of exceedingly doubtful feasibility. In this instance one has only to consider the additional railway facilities which might have been provided at the same cost of \$84,000,000 to be convinced that the Ship Canal has been a dearly purchased means of securing whatever freight reductions may have been effected.

Having seen what were the hopes and anticipations of the

Manchester Ship Canal, and having discovered in how small degree these have been subsequently realized, we have now to inquire what conclusions are to be drawn as to the feasibility of similar undertakings in the United States. Were not, perchance, the engineering problems of this project particularly difficult, and may not the commercial conditions have been peculiarly adverse? And, therefore, despite this failure, may not ship canals in our own country prove successful? Let us consider the conditions existing at Manchester.

In the first place, it is to be observed that Manchester lies only $35\frac{1}{2}$ miles from the open sea, and the elevation is only 70 feet above tide water. The slight elevation minimizes the number of locks needed to control the waters, thereby greatly lessening the cost of construction and maintenance.

In the second place, the builders of the canal were exceptionally fortunate in the matter of construction materials. Suitable filling-in material was plentiful along the entire route, while rock, clay, and sand for the making of the sea wall embankments were found in abundance. For a long period of time over 450,000 bricks per week were produced as needed right along the works.²⁴ Unusually favorable were these very important phases of the engineering work, and there is no record of any exceptional difficulties encountered. The excessive expenditures have never been ascribed to unexpected engineering difficulties. They are admittedly due to the usual underestimates of the cost of deep waterways. It is doubtful if anywhere in the United States can be found conditions so favorable to cheap construction as were present at Manchester.

Furthermore, in the building of a ship canal which costs more than \$2,000,000 per mile, the question of distance is of paramount importance. The amount of traffic on a canal seventy miles in length will, as a general rule, be not much greater than on one thirty-five miles in length, provided both reach an important industrial center; but the cost of construction will be nearly double for the longer distance. Now, in the United States, we have no inland city of half a million people which is not many

²⁴ Tracy, *op. cit.*, p. 9.

hundreds of miles inland. The Erie Canal route from Buffalo to New York is over 360 miles in length. From Chicago to the Gulf of Mexico by way of the Mississippi River the distance is roughly 1,700 miles. Canals of sufficient depth for ocean vessels, as is sometimes advocated, between these points would involve an expenditure of fabulous sums of money. From the standpoint of distance every advantage lies with the Manchester Canal.

Again, the geographical situation of Manchester could hardly be improved upon as a ship canal port. It is the center of the greatest manufacturing region in the United Kingdom and a distributing-point for more than one hundred and seventy industrial towns. Within a radius of twenty-five miles lives a population of 3,778,765, and within fifty miles are 8,726,267 people.²⁵ Bolton, the center of the cotton-spinning district, a city of 170,000, is but nine miles away; Oldham, another great cotton center, with 140,000 people, is but eight miles from Manchester; while Stockport (79,000), Bury (60,000), Ashton (44,000), Eccles (35,000), and Stalybridge (28,000), are other important industrial cities nearby. Manchester is at once a natural terminus and a starting-point—a center of great activity in each way. The enormous manufacturing of the district necessitates the importation of vast quantities of raw materials, while the dense population has to be fed on food-stuffs sent in from abroad. Cotton, wool, flax, iron-ore, timber, oils, dyewoods, paper, paper-making materials, and all kinds of food-stuffs, grain, flour, meat, fruit, etc., are commodities of constant importation. For the back-haul, the export trade, we find tremendous quantities of cotton and other skilled manufactures, all kinds of hardware and machinery, and an abundance of coal from the Yorkshire fields. This traffic was already existent, apparently waiting for the canal to carry it. It did not require an influx of population, and a slow growth of industries to develop it. It was ready at hand. Especially important is the cotton trade which centers about Manchester. The city had control of all the cotton-distributing business, even before the canal was opened. Testimony before the House of Lords in 1885 showed that

²⁵ *Manchester Journal of Commerce*, October 15, 1909, p. 3.

the business is done through Manchester and for many very important reasons. One above all others is that the goods require inspection, and the man who buys the goods to ship requires to know that he is getting the quality he has bought; and the goods are marketed in Manchester, and inspected in Manchester. Then a great portion of the goods require to be finished, some of them dyed, some of them bleached, some of them printed; and all those subsidiary trades are grouped around Manchester. Hence, Manchester practically directs the whole of the cotton trade, and many other trades in the district; and the buyers are all congregated there, and they have their agents abroad who are acquainted with all the requirements of every market.²⁶

It seemed certain that all of this traffic would go by the waterway. In fact, traffic conditions were little short of ideal. There was an abundance of traffic in commodities well adapted to water transport; there was an established trade in both directions, an all-important consideration; and finally, it should be noted that the canal was in the direct line of established routes, not crosswise to the main line of trade as are some of the proposed canals of the United States. It is not surprising that in 1885 M. Fleury, the French expert, visiting Manchester, asked, "In what other part of the globe are conditions so favorably combined?"²⁷ Yet in the face of a conjunction of such exceptionally favorable conditions, the Manchester Ship Canal has proved a financial failure.

In the light of this history, what can be said of the disposition on the part of enthusiastic canal advocates in the United States utterly to dismiss the question of traffic with a dogmatic assertion that of course there will be commodities to ship, that no one with any American spirit can doubt for a moment that traffic will be developed, once the waterways are secured?²⁸ In all the discussion of canals that has taken place in the United States, in all the tons of printed matter that have appeared, only the slightest attention has been given to the question of traffic. There has been absolutely no scientific investigation of the most

²⁶ *Manchester Ship Canal Enquiry before the House of Lords* (J. C. Fielden), 1885, p. 7.

²⁷ Tracy, *op. cit.*, p. 11.

²⁸ See speeches before the Lakes-to-Gulf Convention at New Orleans (*Chicago Tribune*, October 31, 1909).

vital consideration connected with the waterway movement. This is hardly a glowing tribute to renowned American business methods and common sense; but it is the truth.

This English canal project, then, was subject to conditions as favorable as could be desired, with comparatively easy construction, with abundance of traffic in both directions in the region, and with the co-operation of shippers financially interested in the success of the scheme. Conditions are far less favorable in the United States, where greater distances have to be traversed, higher elevations are to be overcome, swifter streams must be controlled; where the population is less dense, and the traffic correspondingly lighter and more uncertain. If the Manchester Ship Canal has proved a failure despite its favorable conditions those persons who would still advocate deep waterways in the United States must indeed be in possession of that proverbial faith which has power to move mountains.

H. G. MOULTON

THE UNIVERSITY OF CHICAGO